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Technical Report on SEC Uptick Repeal Pilot

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The rapid decline of value of individual corporations and the stock market as a whole in 2008 has been variously blamed on changes in fundamental value or selling of borrowed securities (short selling) exaggerating the loss of value of mortgage-backed securities. Here we reanalyze the decision of the Securities and Exchange Commission (SEC) to repeal a rule constraining short selling (the “uptick rule”) in July of 2007. This rule was implemented in 1938 following the market crash of 1929 and the early 1930s. We find that a pilot study performed by the SEC prior to the repeal was incorrectly analyzed and actually demonstrated an economically and statistically significant impact of the uptick rule consistent with the dramatic effects observed following its repeal. Our results suggest that the uptick rule should be restored.

The selling of securities on the New York Stock Exchange (NYSE) from 1938 till June, 2007 was regulated by the "uptick rule." This rule allows the selling of borrowed securities only after an increase in price (on an "uptick"). The SEC's repeal of the uptick rule on July 3, 2007 [1] was largely based on the findings of a pilot study conducted over a 6-month period starting in May of 2005.[2] The study compared pilot stocks for which the uptick rule was removed and control stocks for which it was not. In this report we show that during the pilot unregulated stocks had statistically and economically significantly lower returns. We also note the significance of extreme price movements reported by the SEC. Moreover, we compare periods before and after the uptick rule repeal and find many more stocks with very large single day drops after the repeal. This provides evidence for increased numbers of "bear raids"—when short sellers rapidly sell stock in the hope of triggering margin calls or driving other investors to sell due to fear of

losses. Preventing such manipulations was a key motivation for implementing the uptick rule in 1938. Our findings suggest that the uptick rule has been key to the historical stability of the markets and should be reinstated.

We focus on three key results:

- 1) The original pilot study stated that there was no statistically significant difference in returns between the regulated and unregulated stocks. The results of the pilot (reproduced here in Table 1) were a -2.38% cumulative 6-month return difference between unregulated and regulated NYSE stocks, and a -2.09% difference in NASDAQ stocks regulated by a similar rule. We reevaluated the statistical and economic significance of this result:
 - a. The statistical significance of the six-month return difference is evaluated by comparing the result with a standard error estimated from the distribution of returns of individual stocks. We also conducted additional tests based upon daily returns obtained from the cumulative returns shown in Fig. 1. We found that each of the following tests gave statistical significance for the difference in returns of regulated and unregulated stocks at two standard deviations (95% confidence): (1) combining both the NYSE and NASDAQ data into a single test, (2) using daily average NYSE return differences (not market adjusted) as individual samples, (3) using a fitting to a normal distribution or the Full Width at Half Maximum for the NYSE stocks to obtain the standard deviation, (4) removing 0.5% outliers (7 stocks) of NYSE stocks with over 100% six month returns.
 - b. The 2.38% decrease in average return found by the SEC represents an economically significant decline in return on investment. On average, stocks have appreciated annually in the range of 6 to 7% since World War II.[3] Extending the pilot results for one year gives a 4.8% reduction, which would eliminate over two thirds of the average return. Such a difference would radically change the risk vs. reward of stocks compared to other investment opportunities and could be expected to motivate a dramatic change in investor behavior.
- 2) The pilot study[2] documented a statistically significant increase in extreme reversals in stock valuation of unregulated stocks relative to regulated ones (see Table 2), but discounts this volatility based on the observation that increased numbers of reversals occur both upward and downward. However, the reduction in rapid movements in both directions due to the uptick rule is significant as it can impact the stability of the market in response to external events.
- 3) We performed a study of the number of stocks experiencing large declines in a single day both pre- and post-uptick repeal. These sharp declines serve as a proxy for bear raids.
 - a. Our analysis shows a dramatic, statistically significant, increase in the number of stocks with drops of over 40% of their value in one day (see

Table 3) between 2 pre-selected periods: 12 months following March 31, 2000 (pre-repeal), and 12 months following Sept 30, 2007 (post-repeal). These periods both had overall similar market behaviors. There were no drops greater than 70% in the earlier period, but a total of 7 in the later period.

- b. When considering all (rolling) 12-month periods starting in July 1999 up to October 2008, we found that the most recent period had 45 drops of over 40% while no prior interval had more than 27 such drops.

Taken together, this information strongly implicates the uptick rule repeal as a major contributor to, if not the outright cause of, the current severe financial crisis—a crisis that is greater than any since the crash of 1929 and the subsequent turmoil of the early 1930s. The prevention of such conditions was the original motivation for the uptick rule.

References

[1] Regulation SHO and Rule 10a-1, 17 CFR Parts 240 and 2423, Securities and Exchange Commission, Federal Register, 72, 36348, July 3, 2007, <http://www.sec.gov/rules/final/2007/34-55970.pdf>

[2] Economic Analysis of the Short Sale Price Restrictions Under the Regulation SHO Pilot, Office of Economic Analysis, U.S. Securities and Exchange Commission, Feb. 06, 2007.

[3] M. James, Inconsistent Reports of Long-Term Stock Returns, Jan 22, 2008, <http://michaeljamesmoney.blogspot.com/2008/01/inconsistent-reports-of-long-term-stock.html>

Table 1: Cumulative six month returns of pilot (unregulated) and control (regulated) stocks from the SEC pilot study. NYSE listed and NASDAQ (unlisted) securities are separated (1).

	Market	Pilot	Control	Difference
Return	NYSE	9.18%	11.56%	-2.38%
Return	NASDAQ	14.21%	16.30%	-2.09%
Market-Adjusted Return	NYSE	-2.10%	0.00%	-2.07%
Market-Adjusted Return	NASDAQ	2.26%	4.01%	-1.74%

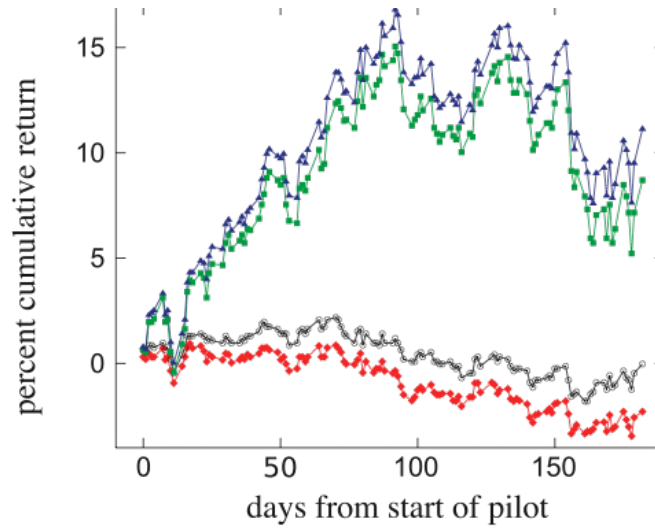


Figure 1: Comparison of returns of regulated and unregulated stocks during the SEC pilot study. (a) Cumulative return of regulated (blue), unregulated (green), market-adjusted regulated (gray) and unregulated (red) NYSE listed stocks during the pilot.

Table 2: Extreme movements measured by the number of reversals in stock price per 100,000 intervals as reported in the SEC pilot study.[2] A negative (positive) reversal was defined as a negative (positive) return immediately followed by a positive (negative) return. The reversal size was defined as the minimum absolute value of the two adjacent returns, normalized by the pre-pilot standard deviation of the stock's return over a four-month period, and the second return is computed as a percentage of the lagged price. Statistical significance relative to the control is denoted by * and ** at the 5% and 1% levels, respectively.

NYSE Stocks				
Reversal Size	Negative Reversals		Positive Reversals	
	Pilot	Control	Pilot	Control
>2	338.4**	281.3	339.1**	281.1
>3	76.7**	65.1	75.4**	63.5
>4	25.0**	20.4	24.4**	19.3
>5	10.0**	8.8	11.3**	8.4
>6	4.9	4.6	5.8**	4.8
>7	2.8	2.8	3.4	3.1
>8	1.7	1.8	2.0	2.2
>9	1.1	1.3	1.2(**)	1.7

NASDAQ Stocks				
Reversal Size	Negative Reversals		Positive Reversals	
	Pilot	Control	Pilot	Control
>2	273.4**	257.4	284.1**	267.8
>3	71.9**	62.8	72.7**	67.0
>4	25.1**	22.4	27.6**	24.6
>5	10.5	9.1	13.2**	11.2
>6	5.3	4.2	6.9*	5.9
>7	3.0	2.2	3.6	3.6
>8	1.9	1.2	2.2	2.2
>9	1.2	0.6	1.6	1.4

Table 3: Evaluation of a proxy for bear raids: the number of stocks with maximum drops over a threshold percentage over a 12-month period. Stocks included are NYSE securities in the Russell 3000 over two 12 month preselected periods after 3/31/00 and 9/30/07 respectively. The number of sharp declines is significantly greater after the repeal of the uptick rule. For comparisons of other periods see text.

Drop size in percent (Q)	40%	50%	60%	70%	80%
Number of stocks with drops greater than Q% in 2000/01	14	4	2	0	0
Number of stocks with drops greater than Q% in 2007/08	32	17	11	7	4
% change in number of drops	129%	325%	450%	∞	∞
Two-proportion z-test	2.52	2.73	2.22	1.89	1.00
Statistical certainty	99.4%	99.7%	98.7%	97%	84%